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Developmental language disorders and risk of recidivism among young offenders

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Background: Although factors such as adverse family background have been widely examined, little is known about the prevalence or potential impact of developmental language disorder (DLD) on risk of recidivism in young people with history of criminal justice system contact. **Methods:** A total of 145 young offenders participated. An adversity score was constructed based on information found in youth justice service records. Data collected included standardised measures of expressive and receptive language, nonverbal IQ and the inventory of callous-unemotional traits. Survival analysis was performed to examine differences in reoffending risk between young offenders with and without DLD. **Results:** The cumulative incidence of reoffending within a year of the young person's court order was markedly raised in the DLD group (62%; 95% CI 52, 72) versus the non-DLD group (25%; 95% CI 16, 39). Furthermore, in the final multivariable survival analysis the independent elevation in risk linked with DLD was not greatly attenuated with adjustment for nonverbal IQ, adversity score, age at first offence, number of previous offences and deprivation score. DLD was the most significant predictor with an adjusted hazard ratio of 2.61 (95% CI 1.80, 3.78). **Conclusions:** Young offenders with DLD are more than twice as likely to reoffend than their unaffected offending peers. DLD is a powerful predictor of recidivism above and beyond other known risk factors. **Keywords:** Young offenders; youth justice; developmental language disorder; criminality.

Introduction

Criminal offending has a major societal impact, and the prevention of adolescent recidivism is therefore a priority for the Youth Justice System (YJS) (Bate-man, 2010). Measuring offender risk is increasingly prominent in forensic research and practitioners match intervention to a perceived risk level (Cording, Beggs, Christofferson, & Grace, 2015). The association between male gender and prior offending in the recidivism literature is persistent (Gendreau, Little, & Goggin, 1996). Previously published studies have also demonstrated that the younger the age at first offence the lower the likelihood of subsequent desistance (Stahler et al., 2013).

Over recent years, an empirical base has developed that delineates the predictive ability of dynamic risk factors (Hanson & Harris, 2000), and prominent among these are growing up with psychosocial adversity (Basto-Pereira, Miranda, Ribeiro, & Maia, 2016), substance misuse (Harrison, 2001), employment status (Kruttschnitt, Uggen & Shelton, 2000) and having a diagnosis of attention-deficit hyperactivity disorder (Young et al., 2011). Callous-unemotional (CU) traits, characterised by a 'lack of remorse and empathy, uncaring behaviours and an inability to express emotion' (Howard, Kimonis, Munoz & Frick, 2012: 1237), specify a subgroup of delinquent

youth for whom serious adverse outcomes are predicted even after controlling for attention-deficit and hyperactivity symptoms, oppositional defiance disorder (ODD) and conduct disorder (CD) (Byrd, Loeber, & Pardini, 2011). Most previous studies of recidivism, however, have focussed on adults or young people who have been incarcerated. There is a dearth of published research to have reported on young people early in their offending trajectory.

The 1998 Crime and Disorder Act (CDA) in England & Wales created Youth Offending Teams (YOTs), multi-agency bodies, which remain the main vehicle by which the aims of the YJS are delivered (Stahlkopf, 2009). Typically, they include representation from health, the police and social services. Young people are referred from local constabularies or the courts to their local YOT and can be subject to a number of orders. Additionally, the publication of the Youth Crime Action Plan (HM Government, 2008) encouraged YOTs to operate triage models for first time entrants (FTEs) into the YJS. Currently, offences are graded from 1 to 8 on a crime gravity score, with 8 reflecting the most serious offences (e.g. murder) and 1 the least. The triage scheme is used for FTEs whose offence corresponds with gravity 1 or 2. Although varying models of triage have evolved across YOTs, it involves a young person attending a single session where the effect on the victim is often considered.

Conflict of interest statement: No conflicts declared.

There is now a growing body of evidence detailing an association between developmental language disorder (DLD) and youth offending. In the UK, Bryan and colleagues reported a prevalence of DLD of between 46 and 67%, among randomly sampled incarcerated youths with a mean age of 17 years (Bryan, Freer & Furlong, 2007). The same authors conducted a larger study in a secure children's home and reported that 42% of the young people, with a mean age of 15 years, scored 1.5 standard deviations or more below the population mean on a measure of receptive language (Bryan, Garvani, Gregory & Kilner, 2015). Research involving comparison groups has generated similar findings. In Australia, Snow and Powell (2008) found significantly poorer group scores on all language measures, including figurative language skills, narrative skills and sentence repetition tasks, for community-based male offenders compared to a demographically matched control group. Such findings are reflected in a study carried out with males aged 14–17 years in a New Zealand youth justice residence. The authors reported that 58% of the young people scored 1.5 standard deviations below the population mean on a standardised language assessment (Lount, Purdy & Hand, 2017). Moreover, 87% of the sample scored below the average (a standard score of 100), corroborating earlier findings from the UK (Bryan et al., 2007). This led the authors to suggest that the normal curve for this population is shifted significantly to the left (Lount et al., 2017), and youth justice staff could view such a level of language skills as being the norm (Bryan et al., 2007).

Cumulatively, this evidence suggests that a disproportionate number of young people who come into contact with the YJS have DLD. Despite methodological variations, findings are consistent, and it is generally accepted that 50%–60% of young offenders evidence language difficulties that would warrant clinical intervention. Moreover, this DLD is usually undiagnosed meaning that youth justice personnel are unaware of its implications (Gregory & Bryan, 2011; Snow & Powell, 2012).

The present study

Although substantial strides in research on the presence of DLD in the youth offending population have been made, most of these studies have been cross-sectional (Gregory & Bryan, 2011; Hopkins, Clegg & Stackhouse, 2018) and have been conducted in samples of young people who are already well entrenched in the criminal justice system (Bryan et al., 2007; Snow & Powell, 2012). Despite the potentially heightened relevance of adequate language skills when navigating the YJS, the impact of DLD on reoffending risk has yet to be examined empirically. There is a dearth of empirical research considering first time entrants (FTEs) and those in the early stages of the YJS concentrating on the

implications of DLD. The present study moves the field forward by addressing the following questions:

1. What is the point prevalence of DLD in a sample of first-time young offenders attending community youth offending services in the North West of England?
2. Is DLD linked with reoffending independent of characteristics known to be associated with recidivism, such as age, offending history and socioeconomic position (SEP)?

We hypothesised that young people in the YJS would display markedly raised prevalence of unidentified DLD. We expected, however, this to be less in first-time offenders, when compared to the prevalence values reported in earlier studies that examined incarcerated young people (of approximately 40%–60%, Bryan et al., 2007, 2015). We further hypothesised that the young people identified with previously unrecognised DLD would be more likely to reoffend compared to their peers without DLD.

Materials and method

Participants and procedures

A sample of 145 young offenders (YO) was recruited from five local community youth offending services in the North West of England. The study received ethical approval from The University of Manchester and informed written consent was gained from all participants.

Managers agreed to embed the procedure within the service for the duration of the project, and therefore, each new entrant to the service was approached by their caseworker about the research. First time entrants into the youth justice service are processed via one of two pathways, dependent upon the severity of their offence. Those who score 1 or 2 on the gravity score matrix are processed via the triage system, a single diversionary contact with the youth justice service. In contrast, those who score 3–8 are typically assigned an order that a YOT caseworker oversees via regular contact. In order to recruit across the breadth of first-time offenders, a dual recruitment pathway was created. A flow chart pertaining to recruitment can be found in Figures S1 and S2.

The intention was to consider first-time offenders, and this was methodologically challenging. Some young people reoffended prior to their appointment with the researcher and others, although processed via triage, had previously received a caution. Therefore, 66% of the sample was comprised of first-time offenders ($n = 96$). The participants were on a variety of orders with the largest numbers being on 3-hr triage sessions ($n = 49$), referral orders ($n = 43$), youth rehabilitation orders (23), or conditional and voluntary cautions ($n = 23$). The remaining

participants comprised of small groups of individuals who were either on reparation orders or had taken part in a restorative justice conference.

The first author, a qualified speech and language therapist who has also received training in the administration and scoring of the Wechsler Abbreviated Scale of Intelligence (Wechsler, 1999), tested all participants in a private session at which parents and youth offending team staff were encouraged to attend. Further information pertaining to the participants and the procedures can be found in Appendix S1.

Materials and measures

The Wechsler Abbreviated Scale of Intelligence (WASI, Wechsler, 1999) Performance subscale was administered as a measure of nonverbal IQ, and standard scores were calculated. The WASI has norms for individuals aged 6 to 89 years. The scale's manual indicates that the reliability of the Performance IQ scale at ages 12–16 years ranges from .84 to .93 for block design and .86 to .96 for matrix reasoning. The reliability coefficients at age 17 are slightly higher. Validity studies of the WASI reported in the manual provide evidence that the test is a valid quick screening measure of intellectual functioning.

To assess language ability, two subtests of the Clinical Evaluation of Language Fundamentals (CELF-4^{uk}) (Semel et al., 2006), a standardised assessment, normed up to age 21 years and 11 months, were applied. These consisted of, first, formulated sentences (FS) that requires the young person to formulate a sentence, including a given word, based on a picture shown. Second, as a receptive measure, the subtest understanding spoken paragraphs (USP) was chosen. This subtest provides a standardised score pertaining to the young person's ability to process, comprehend and formulate a response to factual and inferential information that has been delivered verbally. This mirrors what is expected of a young person in a forensic setting and is therefore deemed to be a good measure of the young person's ability. The CELF-4 manual details the reliability of FS to be .82 and .75 for USP.

In an effort to avoid over-diagnosis, and following recommendations made in the review by Spencer, Clegg and Stackhouse (2012), a score of 1.5 SD below the normative mean on the CELF-4 subscales was used to determine the frequency of DLD. Those with scores above that threshold were classified as non-DLD. A speech and language therapist, independent of the study, scored a random sample of 20% of the formulated sentences subtest. The inter-rater reliability analysis revealed adequate reliability $Kappa = 0.83$, $p = <.001$. Inter-rater reliability was not deemed necessary for the understanding spoken paragraphs subtest as the marking booklet contains prescriptive answers.

As a measure of adversity, a composite variable was constructed from the data extracted from the youth justice service files. This was based on five variables. The derivation of binary variables allowed for a number of psychosocial adversities to be counted providing a score of between 0 and 5. These variables consisted of (a) current looked after child status, (b) not in education, employment or training, (c) self-reported alcohol use, (d) self-reported drug use and (e) no adult in the household in paid employment.

Information relating to prior offending and age at first offence was obtained via detailed scrutiny of departmental files in each youth justice setting. Prior offending was recorded as an event count variable with each recorded prior offence entered.

The Index of Multiple Deprivation (IMD) was applied as an ecological measure of SEP. This is a residential postcode-based measure of small area-level deprivation. Multiple factors are taken into consideration including income, health, education, skills and training deprivation (McLennan et al., 2011). The higher the score the greater the deprivation and overall the IMD can be divided into 5 quintiles, with quintile 1 being the least deprived localities and quintile 5 the most deprived.

The inventory of callous–unemotional traits (ICU), a widely used self-report tool identifying youths at risk for severe impairment, was utilised. It has consistently demonstrated reliability and validity (Kimonis et al., 2014). Further information pertaining to this measure can be found in Appendix S2.

Our primary interest was comparing the risk of reoffending between individuals with and without DLD. Recidivism was measured as the first conviction subsequent to the young person's current order commencing, for two reasons. First, this was deemed to be a more robust measure than arrest, as not all arrests result in conviction, and measuring reoffending on the basis of further arrests could be biased if individuals with DLD are more likely to be arrested but not subsequently charged. Second, these data could be reliably collected by YOT management via their official records and in liaison with the police officer in the YOT.

Statistical analysis

Continuous data distributions were formally assessed for normality using Shapiro–Wilks (Shapiro & Wilk, 1965) tests and between-group comparisons were assessed by *t*-tests. Following descriptive analysis, survival analysis of time to reoffending was performed. Cox proportional hazards model were fitted, with survival time to reoffending for each individual calculated from the date when young person's order commenced. A person was deemed to have 'survived' if they remained conviction-free for the entirety of the 52-week follow-up period. Due to time of recruitment into the study, a small number of participants ($n = 15$) were not followed for the whole duration of follow-up. The median follow-up time

was, however, 52 weeks, and the mean follow-up time was 50 weeks, with survival analysis allowing for right-censoring when a participant is not observed for the full follow-up duration. In these models, the proportion hazard assumption was formally checked using a test for Schoenfeld residuals (Grambsch & Therneau, 1994) and visually by graphical inspection. Survival was first estimated using univariate analysis and Kaplan–Meier survival models with log-rank tests. Models were adjusted for the following potential confounders: nonverbal IQ, adversity score, age at first offence, number of previous offences and SEP. To correct for clustering, regarding youth justice establishment, we applied the Huber–White Sandwich variance estimator (Rogers, 1993). Significance was set at $p < .05$ (two-sided). Cumulative incidence of reoffending at one year of follow-up was calculated as a percentage value (together with its 95% confidence interval) from the Kaplan–Meier survival curve – that is 1 minus the ‘survival’ probability.

Results

Descriptive characteristics of young offenders and their index convictions

Table 1 summarises several descriptive features of the young people studied and the offences that they were initially convicted for, in nonmutually exclusive categories. The mean age of the sample was 15.8 (SD 1.5), and there was no significant difference (t

(143) = 766, $p = .45$) between the age of males ($M = 15.8$, $SD = 1.5$) and females ($M = 15.6$, $SD = 1.5$). Almost half of the young people (70, 48%) had committed a violent criminal offence, including threats of violence (although this subgroup was small comprising of just 8 participants). The greatest majority of the participants, almost two-thirds (66%), resided in the most deprived areas.

Thirty-six participants had a registered special need recorded in their file, which fell into the following three, nonmutually exclusive, categories: behaviour, emotional and social difficulties (SEBD) 16% (23), attention-deficit hyperactivity disorder (ADHD), 10% (14) and autism 2% (3). Independent t -tests revealed no significant difference between males and females for nonverbal IQ ($p = .33$), expressive ($p = .68$) or receptive ($p = .87$) language, the adversity score ($p = .78$), age at first offence ($p = .45$), number of previous offences ($p = .43$), IMD quintile ($p = .58$) or the ICU total score ($p = .26$). Due to this finding, the males and females in the sample were coalesced as one group for all subsequent analyses.

Prevalence of DLD

Eighty-seven participants (60%) were identified as having DLD, although their DLD was undiagnosed, and just two participants reported seeing a speech and language therapist in their primary school years. The results and group descriptive statistics are shown in Table 2. Descriptive statistics for the entire sample can be found in Table S1.

Rates of recidivism

In this sample, 46% ($n = 67$) of the youths reoffended and the mean time to next offence was 33 weeks. No significant gender differences were found, χ^2 (1, $N = 145$) = 246, $p = .62$), with 47% (53) of the males reoffending and 42% (14) of the females. Youths entering the youth justice service with unidentified DLD were at greatest risk of recidivism. Table 3 details reoffending per DLD status.

The cumulative incidence of the absolute risk of reoffending within a year of the young person's court order was 62% (CI 52, 72) for the DLD group and 25% (CI 16, 39) for the Non-DLD group (Figure 1).

After checking the assumption of proportional hazards ($p = .99$), Cox survival analysis was performed. The distribution of the IMD data was concentrated in quintile 5 with too sparse data for the variable to be analysed meaningfully; therefore, the continuous IMD score was utilised. Unadjusted hazard ratios modelling time to reconviction are reported in Table 4. Cox proportional hazards regression confirmed that young offenders with a DLD were more likely to reoffend following commencement of their order than offenders without DLD.

Following adjustment for nonverbal IQ, adversity score, age at first offence, number of previous

Table 1 Offender and index conviction characteristics of the study cohort ($N = 145$)

| Characteristics | Number of sample | Per cent |
|---|------------------|----------|
| Male | 112 | 77 |
| Consumes alcohol | 56 | 40 |
| Drug misuse | 55 | 38 |
| Not in education, employment or training | 38 | 26 |
| Registered special needs | 36 | 25 |
| History of going missing from home | 29 | 20 |
| Current education, health and care plan | 23 | 16 |
| 'Looked After' Child | 22 | 15 |
| Bilingual | 18 | 12 |
| History of self-harm | 14 | 10 |
| Historically received speech and language therapy | 2 | 1 |
| Index of Multiple Deprivation (IMD) quintile | | |
| 1–3 | 18 | 12 |
| 4 | 32 | 22 |
| 5 (i.e. most deprived) | 95 | 66 |
| Offence characteristics | | |
| Violent only | 70 | 48 |
| Offence against property | 39 | 27 |
| Public order/drunken and disorderly | 11 | 8 |
| Drug offences | 8 | 5 |
| Acquisitive + violent | 7 | 5 |
| Motoring offences | 7 | 5 |
| Other | 3 | 2 |

Table 2 Psycholinguistic profiles of the cohort according to DLD versus non-DLD status

| | Group | | <i>t</i> | <i>df</i> | Mean difference | [95% CI] |
|-----------------------------|---------------------------------|---------------------------------|----------|-----------|-----------------|--------------|
| | DLD (<i>N</i> = 87) | Non-DLD (<i>N</i> = 58) | | | | |
| Nonverbal IQ | 83.1 (12.1) (<i>n</i> = 85) | 93.2 (11.1) (<i>n</i> = 56) | 5.01*** | 139 | 10.1 | [6.11, 14.0] |
| Expressive language FS | 67.8 (10.1) | 90.4 (7.4) | 14.6*** | 143 | 22.7 | [19.6, 25.7] |
| Receptive language USP | 67.8 (10.9) | 91.4 (8.8) | 13.8*** | 143 | 23.6 | [20.2, 27.0] |
| Adversity Score | 2.0 (1.3) | 1.2 (1.2) | 3.80*** | 143 | 0.799 | [0.37, 1.22] |
| Age at first offence | 14.2 (1.8) | 15.0 (1.8) | 2.51* | 143 | 0.753 | [0.16, 1.35] |
| Number of previous offences | 2.5 (4.6) | 0.5 (1.7) | 1.95** | 143 | 0.634 | [0.69, 3.20] |
| ICU Total Score | 30.8 (9.0) (<i>n</i> = 44) | 25.4 (8.8) (<i>n</i> = 47) | 5.40** | 89 | 1.87 | [1.69, 9.13] |

All scores are standard score means and in brackets standard deviations. DLD, developmental language disorder; FS, formulated sentences; USP, understanding spoken paragraphs.

* $p < .05$, ** $p < .01$, *** $p < .001$.

offences and the IMD score, the independent elevation in risk linked with DLD persisted indicating that these covariates do not account for the between-group difference. In this final model, two variables remained significant, DLD (HR 2.61, CI 1.80, 3.78) and number of previous offences (HR 1.09, CI 1.05, 1.15). Sequential omission of nonsignificant variables in the analysis revealed the same significant predictors: DLD (HR 2.62, CI 1.74, 3.97), number of previous offences (HR 1.12, CI 1.06, 1.18) and also included the adversity score (HR 1.13, CI 1.01, 1.28).

Three sensitivity analyses were conducted. First, in order to control for developmental problems, we omitted all participants with a registered special need. Second, as only 94 participants completed the ICU, we additionally adjusted for this among the participants for whom this variable was not missing. Both set of analyses did not produce materially different estimates than the first. Finally, as we utilised a composite measure for adversity, we also fitted each covariate that the composite measure was comprised of in a series of five separate models, and we also fitted all of the discrete adversity measures as five binary variables together in one model. This enabled us to check that the adjusted HR estimates for the link between DLD status and reoffending risk were not materially altered irrespective as to whether the key potential confounders were adjusted for using a composite measure versus each covariate fitted separately or altogether in one model. These models did not alter the results, with the adjusted HRs ranging from 2.37 to 2.98, and therefore, the

Table 3 Reoffending by group

| Reoffended | Group status | | Total |
|------------|--------------|---------|-------|
| | DLD | Non-DLD | |
| No | 34 | 44 | 78 |
| Yes | 53 | 14 | 67 |
| Total | 87 | 58 | 145 |

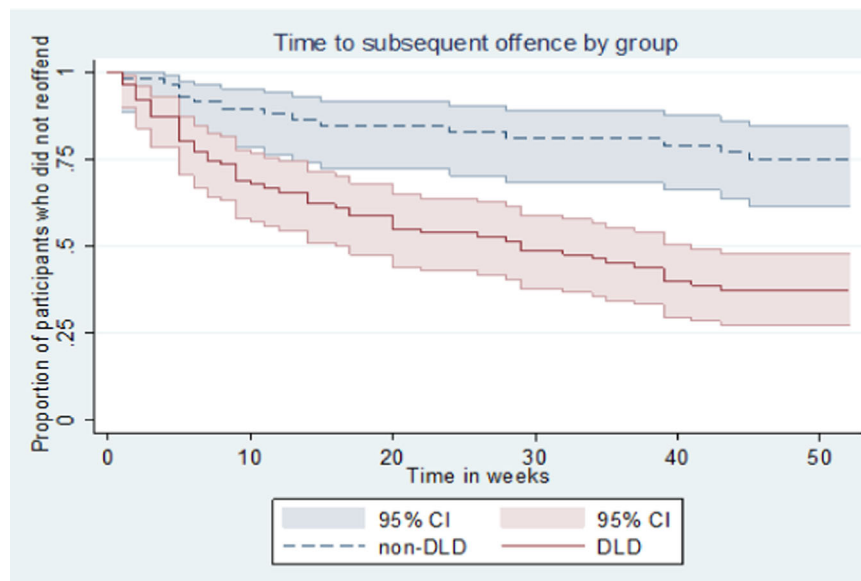
**Figure 1** Kaplan-Meier plot detailing time to subsequent conviction according to DLD versus non-DLD status

Table 4 Hazard ratios for reoffending

| | Unadjusted estimates | | Adjusted estimates | |
|-----------------------------|----------------------|------------|--------------------|------------|
| | Hazard ratio | 95% CI | Hazard ratio | 95% CI |
| Group Status (DLD) | 3.38*** | 2.24, 5.09 | 2.61*** | 1.80, 3.78 |
| Nonverbal IQ | 0.97* | 0.95, 0.99 | 0.99 | 0.96, 1.02 |
| Adversity Score | 1.39*** | 1.30, 1.49 | 1.13 | 0.95, 1.35 |
| Age at first offence | 0.81** | 0.70, 0.93 | 0.92 | 0.78, 1.08 |
| Number of previous offences | 1.14*** | 1.09, 1.20 | 1.09** | 1.05, 1.15 |
| IMD Quintile | 1.01* | 1.00, 1.02 | 1.03 | 0.99, 1.02 |

* $p < .05$, ** $p < .01$, *** $p < .001$.

substantial elevation in reoffending risk among the young persons with a DLD was not explained by the examined contextual adversity factors. The strongest confounding influence observed was not being in education, employment or training. Further information and the adjusted estimates from these sensitivity analyses are reported in Appendix S3 and Table S2.

Discussion

The cumulative incidence percentage values for reoffending were substantially higher for the DLD group than for the non-DLD group. Key variables associated with reoffending were also considered, namely non-verbal IQ, age at first offence, number of previous offences and a composite adversity score. Unadjusted estimates revealed that all of these variables were significantly associated with reoffending. In the adjusted model, DLD remained the strongest independent predictor, with DLD participants over 2.5 times more likely to reoffend within a year. The elevated risk of reoffending for the DLD participants was not explained by the measured confounders or by the presence of a neurodevelopmental disorder.

What does this mean for the youth justice service? Interventions within the youth justice service tend to rely heavily on the medium of language (Snow et al., 2012), and weak language skills may preclude young people from deriving the full benefit of the rehabilitation on offer. Such findings have previously been highlighted (Bryan et al., 2015), whilst a report to the Children's Commissioner detailed the impact that communication difficulties have on a young person's ability to access and benefit from interventions designed to prevent them from reoffending (Hughes, Williams, Chitsabesan, Davies, & Mounce, 2012). This can be seen in practices built on the philosophy of restorative justice such as the referral order. This entails a young offender attending a referral order panel, consisting of youth offending staff, lay members of the community and the victim, should they choose to attend. Referral orders allow the young

offender to take responsibility for the harm caused and foster an appreciation of the impact on their victim (Newbury, 2011). To effectively carry out this role one must listen to, process and keep in working memory complex, emotional accounts that detail the event from the victim's perspective. The actions of a young person unable to manage the linguistic processing and production demands in such a situation are likely to alienate them from others and they may be perceived as rude, disingenuous or lazy (Snow & Powell, 2008). These negative perceptions potentially disadvantage the young person further in their passage through the YJS (Snow & Powell, 2011).

Although the participants in this study were relatively new to the YJS, the estimated prevalence rate (60%) and unidentified nature of these difficulties are consistent with findings from custodial samples in the UK (Bryan et al., 2015) and Australia (Snow, Woodward, Mathis, & Powell, 2016). Despite considerable attempts to recognise DLD at the earliest point in the YJS pathway, existing detection methods lack sensitivity (Hughes et al., 2017). Indeed, the Asset Plus, a comprehensive risk and assessment tool used by YOTs in the UK, relies on self-report from the young person. This results in a disparity between the prevalence values that are reported in research studies and those identified by youth offending team staff (Gregory & Bryan, 2011; Hughes et al., 2017). The delivery of interventions within the YJS would benefit from adaptations allowing for more appropriate interventions and equal access for young offenders with a DLD. Our findings suggest strong collaboration is warranted between youth justice staff and the speech and language therapy profession to enable targeted early identification and language intervention. Only two participants reported previously seeing a speech and language therapist, which suggests potential missed opportunities prior to their involvement with the YJS.

This study involved a large number of participants and a variety of factors potentially associated with recidivism. It is also important to consider, however, the specific context of the investigation. The time to follow-up was relatively short and, as the participants were still adolescents, a longer follow-up time may have revealed more offences (Moffitt, 2007). Additionally, some participants could have been waiting to attend court for offences that subsequently resulted in a conviction. Our conservative approach may have led to an underestimation of recidivism, and, conversely, we acknowledge that a limitation in data recording is the fact that not all crimes are detected and therefore recorded.

A methodological challenge relates to the voluntary nature of participation, which makes the study susceptible to self-selection bias. Young people who opted to participate may have been more motivated or perceived that they had sufficient skills to engage. In the YOTs, just over half of the young people referred attended the appointment offered. It would

be reasonable to conclude that those who failed to attend did not want to take part in tasks they perceived to be difficult, and therefore, the prevalence of DLD may have been underestimated. Due to time constraints, this study concentrated on the structural aspects of language, and so no measure of social communication disorder was recorded. Successful communication in life depends on all such domains, and it is important therefore to explore all areas of language functioning.

Conclusion

In summary, this study has yielded novel evidence indicating that language difficulties are a key predictor of recidivism among young offenders: they are at least twice as likely to reoffend as their peers without a DLD, and this was independent of non-verbal IQ, adversity score, age at first offence, number of previous offences and the deprivation score. These findings identify language as the key factor in the continuation of offending behaviour and, therefore, underscore the importance of considering the language skills of young offenders. We posit that young people with unidentified DLD represent a group of young people who are challenged in their ability to access verbally mediated strategies in the youth justice service. Implicit in many youth justice interventions is the presumption that young people have the ability to effectively engage with the interventions. Our research is unique as it involves a large sample of offenders and clearly points to the need to identify youths with DLD at the earliest point of entry into the YJS. Failure to address suboptimal language abilities, that is the component skills that limit a young person's ability to actively participate in verbally mediated interventions, makes the understanding of them more challenging. The unidentified nature of the language difficulties experienced by these young people is one area of risk that may be unintentionally overlooked. In the current youth justice framework, language is overshadowed by factors considered more influential, which is problematic because our findings suggest that having a developmental language disorder is the most potent

risk factor preventing a young offender from desisting from committing further criminal acts.

Supporting information

Additional supporting information may be found online in the Supporting Information section at the end of the article:

Appendix S1. Supporting information pertaining to the participants and the procedure.

Appendix S2. Supporting information pertaining to the ICU measure.

Appendix S3. Supporting information pertaining to the results.

Figure S1. Flowchart pertaining to recruitment of young offenders scoring 3–8 on the gravity score index.

Figure S2. Flowchart pertaining to recruitment of young offenders scoring 1–2 on the gravity score index.

Table S1. Descriptive statistics (psycholinguistic profiles) for the entire sample ($N = 145$).

Table S2. Adjusted hazard ratios indicating the strength of the confounding influences of the adversity measures on the relationship between having a DLD and reoffending risk examined via a series of multivariable models.

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Key points

- Research with young people in the YJS suggests that a disproportionate number have unidentified DLD.
- This is the first study to consider the apparent impact of DLD on reoffending risk.
- DLD participants were over 2.5 times more likely to reoffend within a year. The elevated risk of reoffending for the DLD participants was not explained by nonverbal IQ, age at first offence, number of previous offences, a composite adversity score, deprivation score, the presence of a neurodevelopmental disorder or callous–unemotional traits.
- The findings point to the need to reliably identify youths with DLD on entry to the YJS. Failure to address suboptimal language abilities may limit a young person's ability to actively participate in verbally mediated interventions.

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